HAER
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3-MILF.V,
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MISPILLION LIGHTHOUSE; BEACON TOWER
South bank of Mispillion River at its confluence with Delaware River at northeast end of County Road 203, 7 mi. east of Milford
Milford Vicinity
Sussex County
Delaware

HAER No. DE-23-A

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

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HISTORIC AMERICAN ENGINEERING RECORD

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Location:	South bank of Mispillion River at its confluence with Delaware River at northeast end of County Road 203, 7 mi. east of Milford Milford Vicinity Sussex County Delaware UTM: 18.472690.4310740 Quad: Mispillion River
Date of Construction:	1929; originally built 1924 at Cape Henlopen, Delaware, and moved and re-erected on present site
Present Owner:	United States Coast Guard
Present Occupant:	Unmanned
Present Use:	Beacon tower for small craft entering Mispillion River from Delaware Bay
Significance:	The beacon tower is associated with Mispillion Lighthouse, one of three surviving lighthouses in Delaware, and is an early example of the importance of steel-frame tower construction in providing reliable, unmanned aids to navigation in remote areas.
Project Information:	Report prepared May 1992 by Massey Maxwell Associates, Historic Preservation Consultants, P. O. Box 263, Strasburg, VA 22657, as mitigative documentation prior to demolition of the tower, in accordance with a Memorandum of Agreement among the United States Coast Guard, the Delaware Department of Archeological and Historical Resources, and the Advisory Council on Historic Preservation. James C. Massey, Architectural Historian Shirley Maxwell, Historian Jack E. Boucher, Photographer

The Mispillion Lighthouse Beacon Tower is a 60-foot steel skeleton tower constructed in 1924 as a variation of a standard Light House Service plan that was probably designed in 1923.[1] It represents an early use of this form to provide reliable, inexpensive, unmanned aids to navigation, particularly in remote locations. The tower was in place at Cape Henlopen, Delaware, for five years before being moved to its present site at the confluence of the Mispillion River, Cedar Creek, and Delaware Bay in December 1929. Its light replaced one formerly housed in a manned, wood-frame lighthouse on the site. Presently standing on the small portion of the original Mispillion Lighthouse site that remains in government ownership, it serves as a guiding light for pleasure boats entering the Mispillion River from Delaware Bay. Throughout its history, the light has been periodically discontinued and reinstalled, as its usefulness has declined and resurged, depending on the navigability of the waters it serves.

The Lighthouse Service drawing for the tower (Drawing No. M-2T-4) was not located in the course of this study;[2] however, contemporary documents and an examination of the tower itself make it clear that the height was adapted from 40 feet to 60 feet by adding two sections of the standard plan at the base of the tower. (The specifications call for the insertion to be made[3] "between points G and H and H and I" on the drawing). It is not known where the riveted and bolted tower was fabricated, but it was probably shipped to its original site from the Lighthouse Service region's principal depot at Edgemoor, Delaware. Although the Cape Henlopen/Mispillion tower was taller than some others of its general type because it needed to rise above prevailing ground haze at those sites, similar structures were provided at many other light stations in Delaware and elsewhere. Not only were the skeletal towers inexpensive to construct and maintain, but the speed and ease with which they could be built meant that lights rarely needed to be extinguished for new construction or repair.[4] Acetylene gas to power the lights was generated on the site from calcium carbide in accumulators, or cylinders, stored in a steel shed erected within the tower. Gas cylinders were periodically replaced or recharged by Coast Guard tender crews. A steel ladder provided access to the lantern platform at the top of the tower. In minor lights, such as that at Mispillion, the lantern consisted of the base, lens, protective frame and lighting equipment. (See illustration, "Acetylene Lantern Assembly.")

The steel tower was first erected on the Cape Henlopen site in 1924 in anticipation of the impending loss of Cape Henlopen's venerable masonry lighthouse tower to beach erosion. The old light was discontinued on October 1 of that year, and the light

on the steel tower was substituted. From the beginning, the new tower was viewed as a "portable" structure which would eventually be removed and re-sited when a light at Cape Henlopen was no longer needed.[5] Improvements to other aids to navigation in the area made the Cape Henlopen light redundant, and it was discontinued altogether in 1929. In December 1929 the tower was moved to the Mispillion site, where it replaced in function the shingled, wood-frame lighthouse tower that had been built at Mispillion in 1873. (See separate HAER documentation, DE-23.)

The dismantling and re-erection of the beacon tower was undertaken with hired and depot labor and Coast Guard vessel crewmen. At Mispillion, the tower was erected on a 14'-square reinforced-concrete platform resting on a pile grillage. The tower was supported by four slope-sided concrete legs integral with the platform. The steel shed was moved from the second stage of the tower to ground level, probably accounting for the difference in bracing patterns at the second level in the Mispillion installation, noted in the description below. Horizontal slatted wooden daymarks were later replaced with a single, large, diamond-shaped black and white daymark. A new lantern (360°, 375-mm., 480-candlepower, with red sector, K-130 flasher, cut-glass lens, and sunvalve bracket) was ordered for use at Mispillion. Six A-50 gas accumulators were already on hand at the station. Later, probably in the 1940s, the light was converted to electricity.[6] The present light is clear, with no red sector, and flashes at 4-second intervals.[7]

Although the acetylene-gas light and steel tower were virtually maintenance-free, for the first few years after construction a caretaker was hired to stay in the old Mispillion lighthouse in order to discourage vandals or squatters on the isolated property. The custodian's position, last filled by Alexander Still, was discontinued in 1932 when the lighthouse and most of the government-owned land surrounding it were sold to private parties. The government retained ownership of only .1866 acre, just enough to contain and provide access to the steel beacon tower. After the sale, the Coast Guard relied on the new owners for site security and notification of any problems that might arise with the light.

The Mispillion lighthouse and its solid tower were used for many years as part of a restaurant/marina complex, which, although still standing in 1992, is now abandoned except as storage areas. Both the lighthouse and the steel tower were listed in the National Register of Historic Places in 1986, and the lighthouse was recorded for HAER in 1989 (HAER DE-23).

Description of Site

The beacon tower site is located only slightly above the river level in a flat area of sand and tidal marsh, probably filled, at the confluence of Mispillion Creek and the Delaware River. The tower is protected from the river by stone riprap and faces the channel to the Delaware River on axis. A small marina with a plain wooden dock for pleasure boats is at the end of the channel on the southeast side of the site. Approximately 25 feet to the north of the beacon tower, on private property, is the Mispillion Lighthouse, still standing but in seriously deteriorated condition in 1992. Immediately northeast of the steel tower is a small, deteriorated cinder-block structure. The restaurant to the northeast is abandoned and collapsed. To the northwest is the site of a house, also collapsed. County Road 203 abuts the Coast Guard property on the south corner and leads west toward State Road 36 to a series of small houses. The site contains no significant trees or shrubs. Most of the ground around the beacon and the lighthouse is gravel and oyster shell.

Description of Structure

The 60-foot steel tower was built from a standard Light House Service plan for a 40-foot tower, which comprises the upper section of the tower, and a 20-foot lower section built in one piece from standard plans for two ten-foot sections. The tower rests on four 12"-high cast-iron bases, which in turn are bolted to the concrete platform and structural base. The tower construction is in two sections with a total of eight stages. Four steel angles rise, one from each corner of the 11'-6"-square base, sloping together in a straight line to a narrow top approximately 2'-0" square. With the exception of the second stage, where there is a variant angle bracing pattern on the southeast face that does not create an X, each stage is braced by an X-frame of steel angles. (See attached plan, elevation, and photographs.) At the original Cape Henlopen site, the steel shed was located at this stage, probably accounting for the enlarged opening in the bracing. At the top of the tower is a steel platform, approximately 6'-0" x 6'-0", mounted on a crossed grillage of steel angles. On the platform is an iron-pipe railing and a steel pipe-frame support for the light itself. The upper stages of the tower decrease in height as the tower rises, from 9'-0" square to 5'-0" square. The bottom two stages are each 10'-0" square. Each stage is reached by a steel ladder rising from the concrete platform and giving access at the top to the platform on which the light is mounted. The steel angles that compose the tower are joined by a combination of bolts and rivets, with steel-plate gussets at each intersection. The whole

is in turn fastened to the concrete base by bolts in the cast-iron base. The four principal corner posts are 4" x 4" x 1/2" angles. The horizontal crosspieces of the lower stages are formed of 2-1/2" x 3-1/2" x 1/2" angles riveted together. The principal X-bracing is of 2-1/2" x 2" x 1/4" angles.

On the concrete platform is a small steel shed, 5'-0" x 5'-0", with a small 2'-0" x 6'-0" steel door. The shed has a low gable roof rising to a maximum height of 7'6". The construction of the steel shed is 1/4" steel plate and steel bars and angles. There is a rooftop vent that rises 6", and other cast-iron vents are on the sides near the platform level. A 6'-0" x 6'-0" diamond-shaped daymark, apparently of plywood, with four diamond-shaped sections painted alternately in black and white is mounted on the tower across the fifth stage. The earlier daymark consisted of a series of horizontal 1" x 6" boards mounted on 3" x 4" wood supports fastened to the corner posts from stages 3 through 8. (The tower at Cape Henlopen had slats mounted on three sides, but at Mispillion they were mounted only on the front. See old photographs.) The supports are still in place and show traces of the 1" x 6" light boards; however, only the topmost board survives in place. Surrounding the beacon tower is a high, modern chain-link fence. Mounted on the south pier is a metal plate marked "U.S. Coast and Geodetic Survey F-30 Benchmark 1962."

Overall, the structure is in severely deteriorated condition, with much advanced rust and corrosion in the structural members, bolts, nuts, and rivets. Some have completely corroded. Although it is now painted brown, there is evidence that the original paint color was black.

1. John S. Conway, The United States Lighthouse Service, Edition of 1923 (Washington, D.C.: U. S. Government Printing Office, 1923), p. 17: "Recent improvements. . . include structural steel skeleton towers, also similar towers of iron pipe. Standard plans have been developed for each of these types, both of which are useful when quickness of construction is desired. . . Each type is square in plan and strongly braced with due provision allowed for corrosion in proportioning the sizes of the members."
Readers were referred to a photograph of Fairport West Pier Light, Ohio, showing a steel structure identical to that at Mispillion.

2. As of June 1992, the drawing was said by Coast Guard personnel in Cleveland to be part of a shipment of Coast Guard records sent to the National Archives but not yet processed for deposit.

3. Standard Form 83 ("Proposed Work: . . .), June 4, 1923. National Archives, Record Group 26, "Correspondence of the U.S. Lighthouse Service, 1900-1939," File 423-E.

4. The 1923 edition of the publication, United States Lighthouse Service, contains a photograph of such a tower at the station at Fairport West, Ohio, and one was erected in 1926 during the construction of a permanent tower at Harbor of Refuge, Delaware, according to the Lighthouse Bureau's annual report for 1926. Among other Delaware examples are those at Fort Mahon, Fowler Beach, and Lewes (the last no longer in use).

5. Letter, G.R. Putnam, Commissioner of Lighthouses, Dec. 28, 1923 (National Archives and Records Service, RG 26, "Correspondence of the Bureau of Lighthouses, 1911-1939," File 423A).

6. Telephone conversation May 1992 with Gary Nelson (USCG, Civil Engineering Unit, Cleveland, Ohio). According to a chronology of lighting sources of aids to navigation in the Coast Guard's engineering instructions issued in 1944, widespread use of electricity at both attended and unattended stations began in 1928; by 1941 it was used in most of the larger lighthouses. Presumably minor lights such as that at Mispillion would have been electrified during the war if they had not been earlier.

7. Interview with Robert Slova, Mispillion dockmaster, May 11, 1992.

Sources Consulted:

Conway, John S., Deputy Commissioner of Lights, comp. The United States Lighthouse Service, Edition of 1923 (Washington, D.C.: Government Printing Office, 1923

Gredell & Paul, "Historic Context for Aids to Navigation in Delaware." Typescript report prepared for State of Delaware, Division of Historical and Cultural Affairs, Historic Preservation Office. Wilmington, Del.: Gredell & Paul, 1989.

Holland, F. Ross. America's Lighthouses, An Illustrated History. Brattleboro, VT: Greene Press, 1972.

National Archives and Record Administration, Washington, D.C., Records Group 26, Records of the U.S. Coast Guard:
Clipping File, U. S. Lighthouse Service, Box 7
Correspondence of the Bureau of Lighthouses, 1911-1939
Still Pictures Branch, National Archives and Records Center
Cartographic Branch, Alexandria, Va.

Nelson, Gary, Civil Engineering Unit, U. S. Coast Guard, Cleveland. Telephone interview.

Paul, Michael Johannes. "Historic American Engineering Record, Mispillion Lighthouse, HAER No. DE-23." Typescript HAER report.

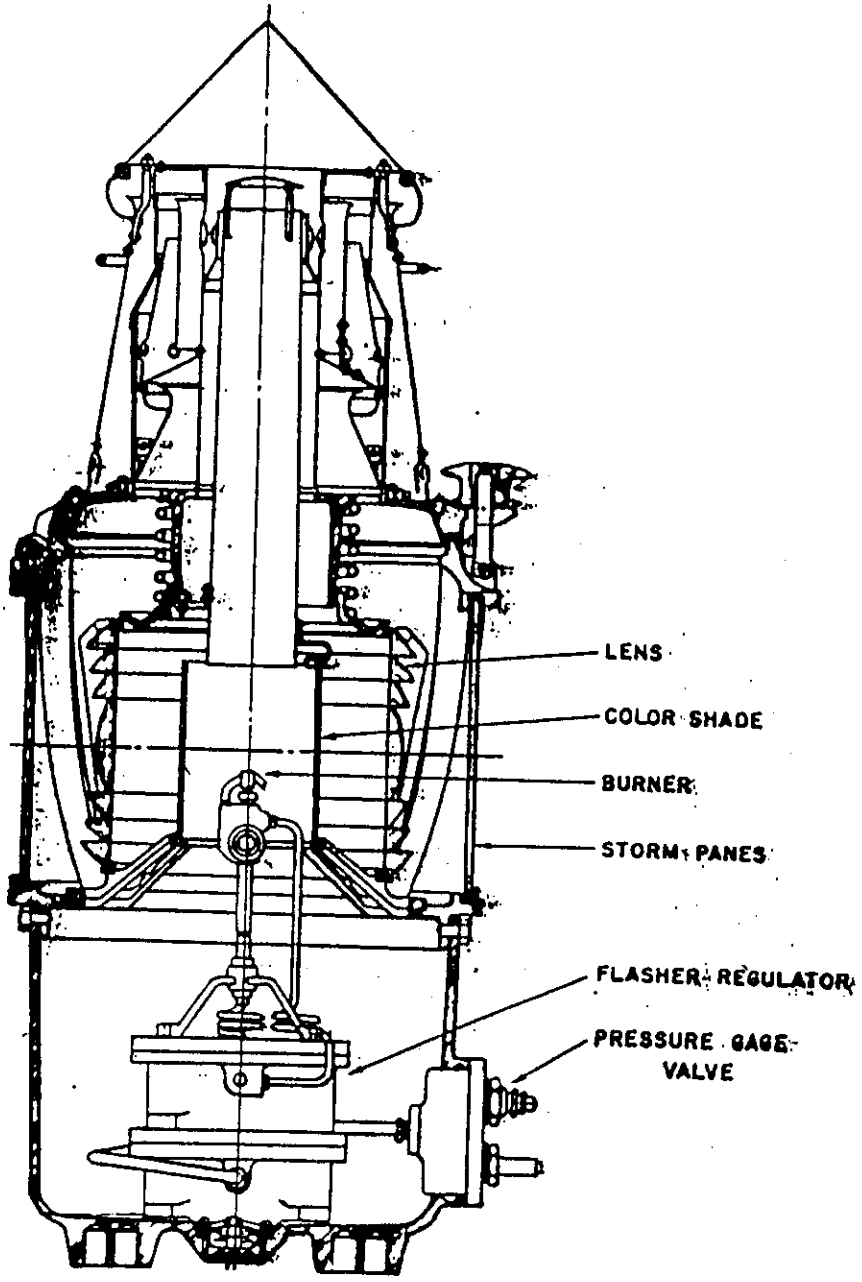
Ross, Albert. Report on Use of Acetylene Gas by the Canadian Government as an Illuminant for Aids to Navigation. Washington, D.C.: Government Printing Office, 1907. Copy in National Archives Records Group 26.

Slova, Robert, Dock Master, Mispillion. Interview, May 11, 1992.

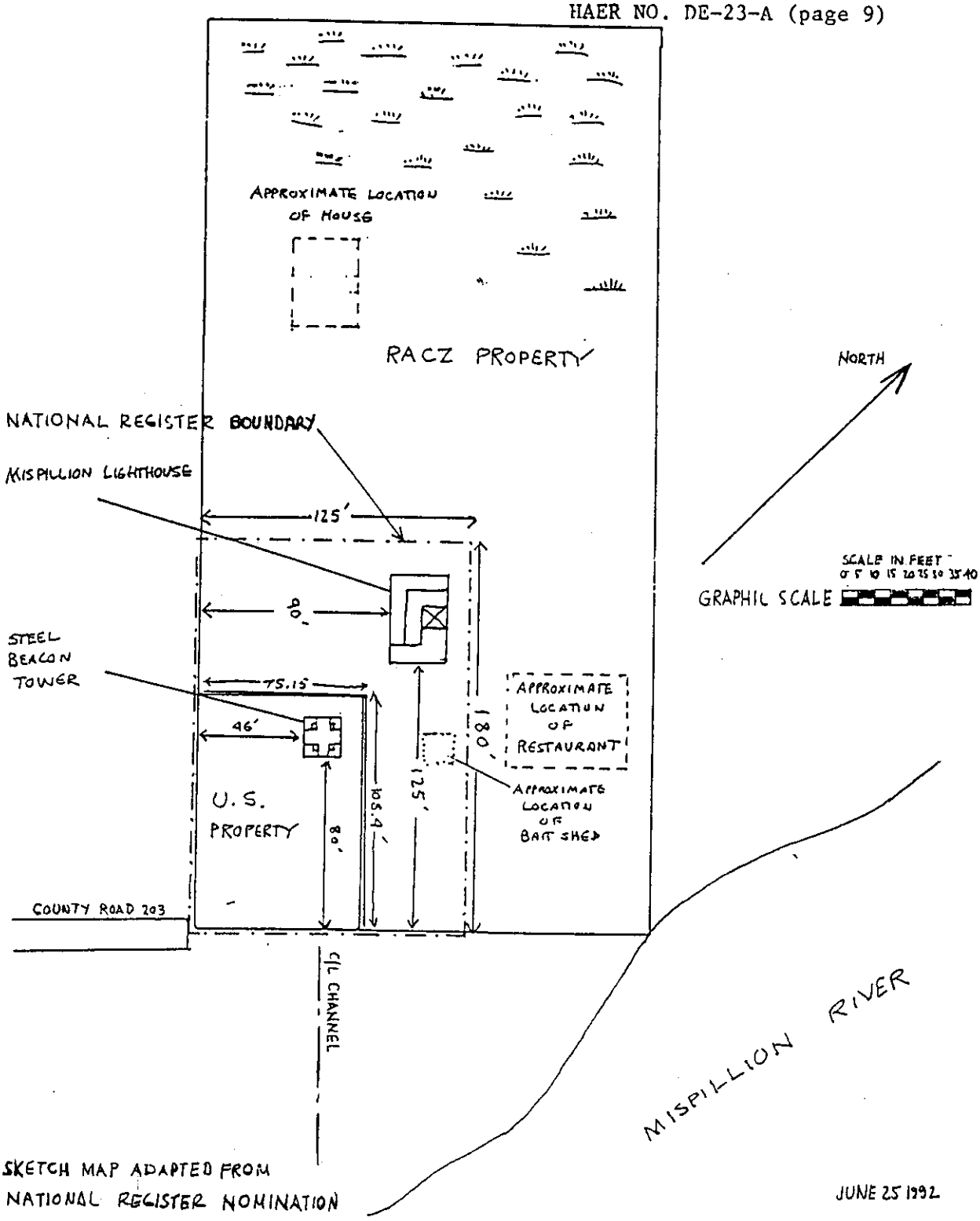
Small, Nora Pat. "Lighthouses of the National Park Service, a Catalogue." Washington, D.C.: National Park Service, Division of Historical Architecture, 1983. Typescript.

Sussex County Preservation Office. National Register of Historic Places: "Mispillion Lighthouse." Nomination form. January 1986.

U. S. Navy Department, Engineering Instructions, United States Coast Guard, Chapter 31: Lighted Aids to Navigation. Washington D. C.: U. S. Government Printing Office, 1944. Copy in Cleveland Office, USCG.

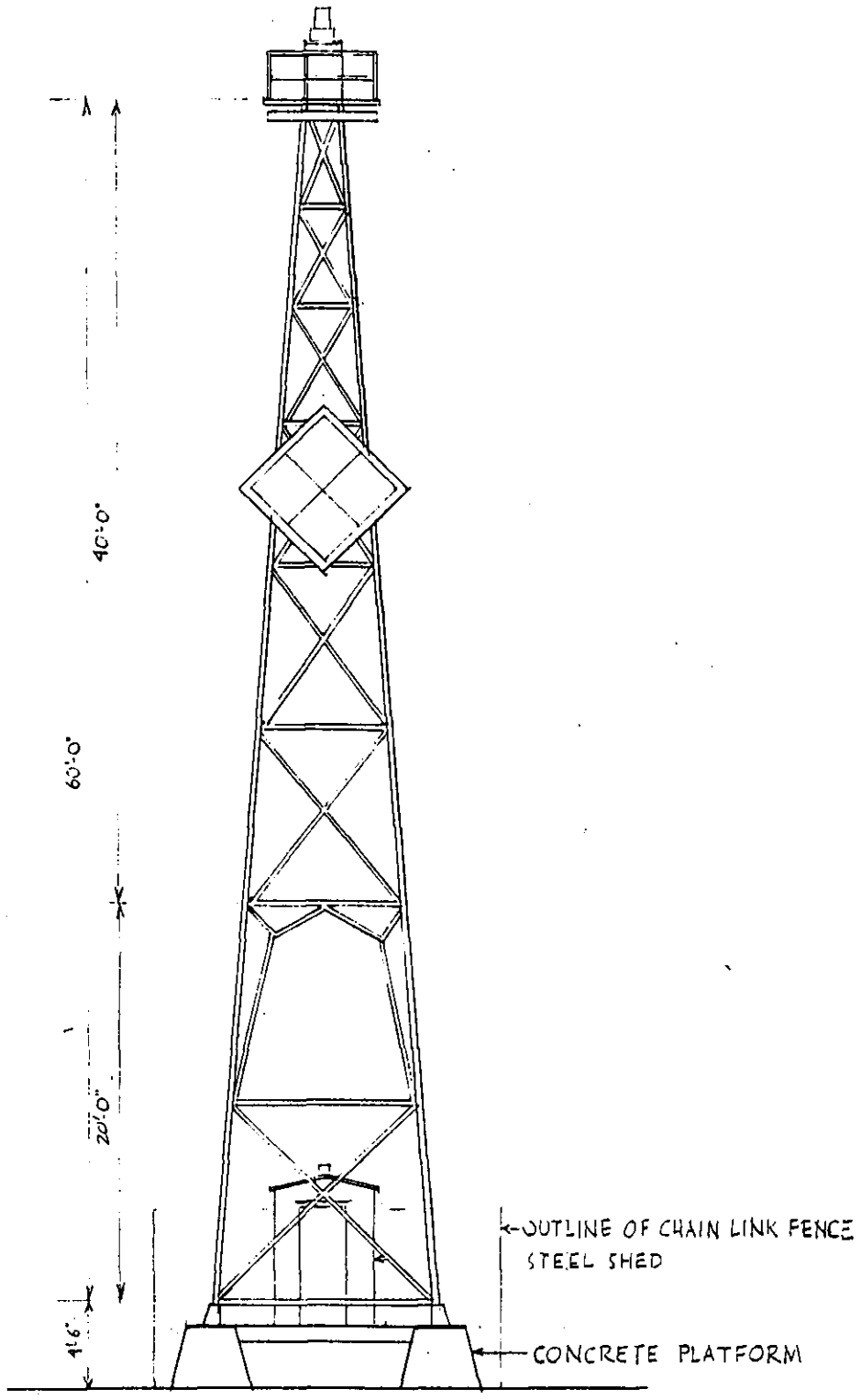


TYPICAL ACETYLENE LANTERN ASSEMBLY similar to that used at Mispillion Lighthouse. Drawing from U.S. Navy Department, Instructions, United States Coast Guard, Chapter 31: Lighted Aids to Navigation (Washington, D.C.: U.S.G.P.O, 1944). Copy in office of USCG Civil Engineering Unit, Cleveland, Ohio.



SKETCH MAP ADAPTED FROM NATIONAL REGISTER NOMINATION

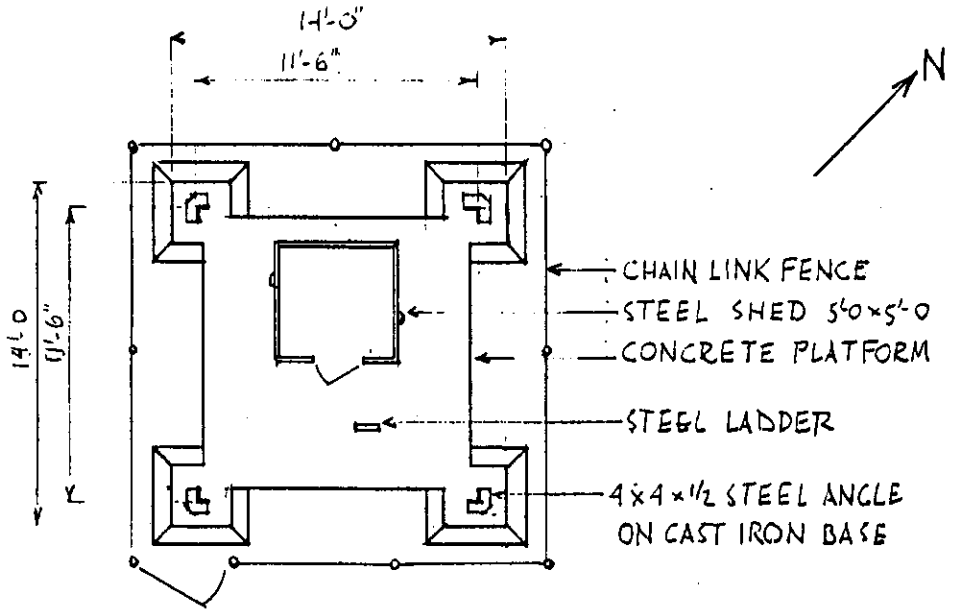
JUNE 25 1992



S.E. ELEVATION

GRAPHIC SCALE 0 1 2 3 4 5 6 7 8 SCALE IN FEET

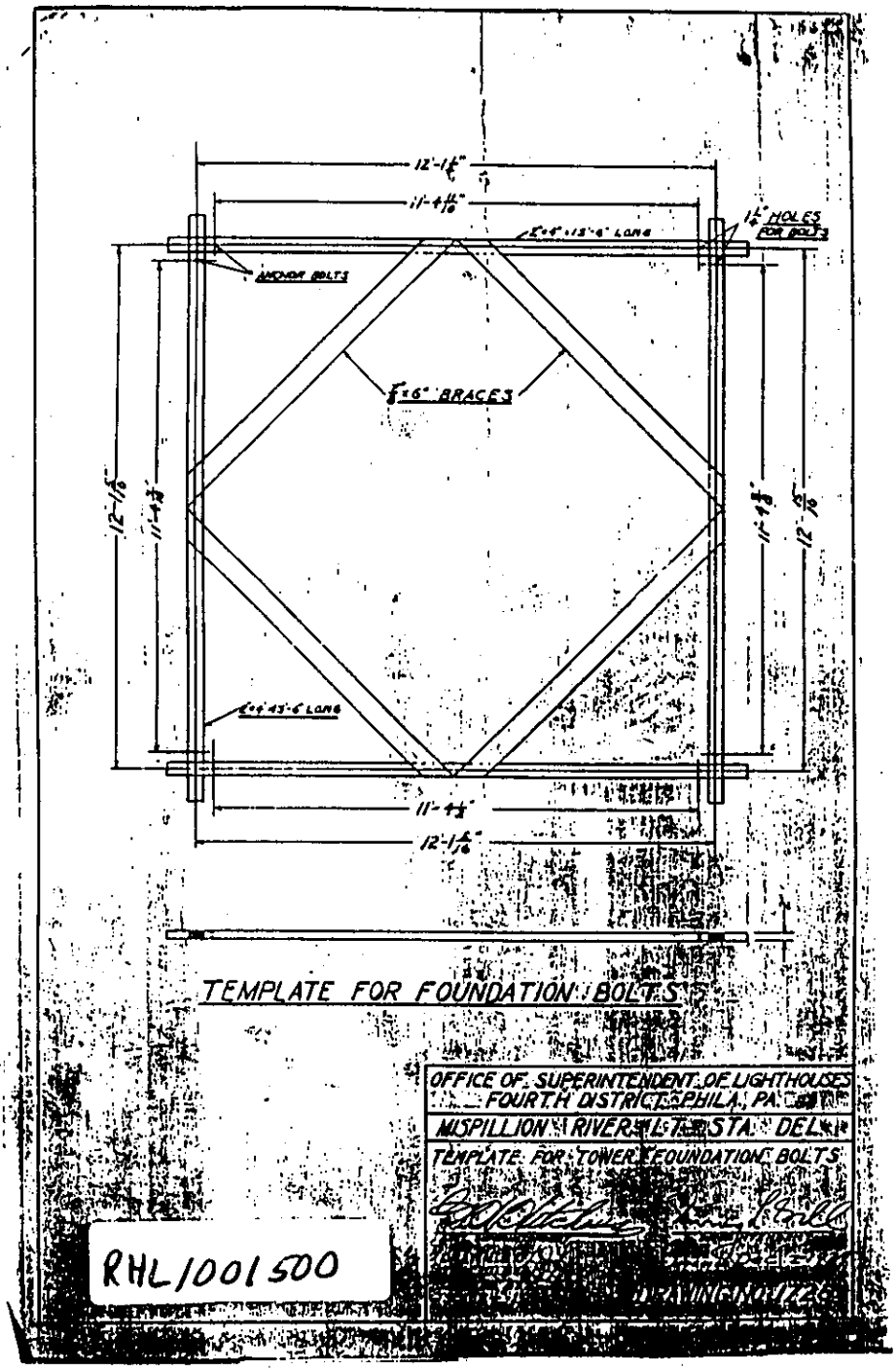
DEL: J.C. MASSEY JUNE 28 1992



PLAN

GRAPHIC SCALE SCALE IN FEET 0 1 2 3 4 5 6 7 8

DEL: J.C. MASSEY, JUNE 28, 1992



Template for Foundation Bolts, Mispillion Light Station, Del. Drawing No. 1725, Dec. 2, 1929. (Office of Superintendent of Lighthouses, Fourth District, Philadelphia, Pa.

ADDENDUM TO:
MISPILLION LIGHTHOUSE, BEACON TOWER
South bank of Mispillion River at it confluence with Delaware River at
northeast end of County Road 203, 7 miles east of Milford
Milford vicinity
Sussex County
Delaware

HAER DE-23-A
DEL,3-MILF.V,2A-

PHOTOGRAPHS

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PHILADELPHIA SUPPORT OFFICE
National Park Service
U.S. Department of the Interior
U.S. Custom House, 3rd Floor
200 Chestnut Street
Philadelphia, PA 19106